

contact formed in the second insulator and in contact with said at least one metal pad.”

According to the claim, the solder contact has a “diameter less than 100 microns.”

Applicant respectfully submits that the cited combination fails to teach or suggest these limitations.

Specifically, Yamamoto fails to teach or suggest solder contacts having a diameter less than 100 microns. This fact is acknowledge in the Office Action at page 3. To compensate for this deficiency, the Office Action combines Yamamoto with Akram and Applicant’s description of C4 bonding and its associated problems (referred to as APA in the Office Action). Applicant respectfully submits, that the combination of the cited references is improper.

Initially, Applicant respectfully submits that there is no motivation to combine the teachings of the cited references. The claimed invention recites solder contacts that are at least two orders of magnitude smaller than prior art solder contacts (Specification page 5, lines 1 to 10). The large prior art solder contacts directly impact the number and density of the I/O terminals that can be provided on a semiconductor device. The number and density of these I/O terminals relates directly to the device’s data transmission rates. By reducing the size of the solder contacts, the number and density of I/O terminals can be increased, allowing for a significant increase in data transmission rates for the final IC device (Specification page 4, lines 18 to 25).

It should be noted that this problems is only identified and addressed by the present application. Since none of the references recognize the problem, which is solved by

the claimed invention, there is no motivation, teaching or suggestion in the references for the claimed invention. Indeed, the courts and PTO have uniformly established that recognition of the source of a problem renders a claimed invention unobvious. In re Spinnoble, 405 F.2d 578, 160 U.S.P.Q. 237 (CCPA 1969); Ex parte Campbell 211 U.S.P.Q. 575 (PTO Bd. App. 1981). Stated otherwise, if the prior art does not even recognize the problem, the solution to the problem can not be deemed obvious. This is the situation we have here. Accordingly, Applicant respectfully submits that it is improper to combine Yamamoto in view of Akram and APA to render the claimed invention obvious.

Moreover, the different technologies of the references and the APA render it is improper to combine them. Yamamoto teaches the use of solder balls in a semiconductor device. Akram describes an electroplating process used in flip chip soldering. Akram does not relate to C4 bonding. Applicant's APA, presuming Applicant admitted anything, relates to C4 bonding, its associated problems and a desire to correct the problems. The APA does not relate to electroplating and does not relate to flip chip interconnects as described in Akram. One of ordinary skill in the C4 bonding art would not look to the teaching in Akram to improve C4 solder balls. The technologies are completely different. This is one more reason why the references should not be combined with the APA.

For at least the foregoing reasons, claim 40 is allowable over the cited combination. Claims 41-51 and 68-70 depend from claim 40 and are allowable along with claim 40. Claims 71-73 recite similar limitations as claim 40 and are allowable for at least the reasons set forth above and own their own merits. Accordingly, the rejections should

be withdrawn and the claims allowed.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue.

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Respectfully submitted,

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